

REMARKS

Claims 1-6, 10-19, and 40-53 remain pending.

The Examiner has objected to the specification of the application for incorporating subject matter by reference to an Attorney Docket Number. The specification has been amended to provide U.S. application numbers which correspond to these Attorney Docket Numbers.

The Examiner rejected claims 1-6, 10-18, and 40-53 under 35 U.S.C. §103(a) as being unpatentable over Abe (U.S. patent 6,108,304) in view of Hanson (U.S. patent 6,633,861). The Examiner has also rejected claim 19 under 35 U.S.C. §103(a) as being unpatentable over Abe in view of Hanson and in further view of Desai (US 5,781,703). The Examiner's rejections are respectfully traversed as follows.

Claim 1 is directed towards a method “for providing dynamic feedback control of network elements in a data network, the data network including a plurality of network elements, each of said network elements having a plurality operating parameters associated therewith, said operating parameters being related to at least one control parameter of said element.” Claim 1 also requires “receiving information relating to an operation of a first subset of the plurality of network elements” and “providing at least a portion of said received information to at least one analysis entity for analyzing said portion of received data and calculating updated control information based on such analysis, wherein the updated control information specifies a limit on the operation of the at least one network element” Claim 1 also requires “receiving the updated control information calculated by the analysis entity” and “providing the updated control information to at least one of the network elements.” Independent claims 40, 47, and 53 have a similar limitation regarding updated control information.

In other words, updated control information which specifies a limit on the operation of a network element (NE) is calculated based on analysis of information that relates to the operation of a subset of network elements. This updated control information which specifies a limit on the operation of a NE is then provided to such NE. The present invention advantageously provides dynamic feedback for controlling and specifying a limit on the operation of a NE based on analysis of network operation. In other words, a feedback loop is provided for specifying a limit on the operation the operation of each NE on the fly, as opposed to pre-configuring operation in a single event, *e.g.*, as part of a service subscription package.

The primary reference Abe discloses a system having a network management equipment (200 of Fig. 1) which receives bandwidth values for routes connected to other network elements EA~ED (Fig. 1). The received bandwidth information is then used to calculate an available

bandwidth for such routes, and this calculated available bandwidth information is sent to the network elements EA~ED so they can determine which routes to use based on the available bandwidths of such routes. See Column 7, lines 32-60 and Column 9, lines 1-12. As the Examiner admits, Abe fails to disclose providing control information that specifies a limit on the operation. It is respectfully submitted that Abe also fails to teach or suggest providing at least a portion of the received information (which relates to the operation of the first subset of network elements) to at least one analysis entity for analyzing the portion of received data and calculating updated control information which specifies a limit on the operation of a NE based on such analysis. Abe also fails to teach or suggest that such received information is provided to such analysis entity for calculating update control information which specifies a limit on the operation of a NE based on such received information and, accordingly, also the subnet's operation, in the manner claimed. Abe also fails to teach or suggest providing update information, which specifies a limit on the operation of a NE, that was calculated based on such received information to a network element, in the manner claimed.

The secondary reference Hanson also fails to teach or suggest such limitations. In brief, Hanson merely teaches providing a network operation parameter (CUF) to a node so that the node can self-limit its operation based on such network operation parameter, rather than providing an updated control information which specifies a limit on the operation of a NE and which was calculated based on network operation. Specifically, Hanson teaches that the network operating parameter CUF is simply "a measure of the utilization factor, which is a measure of the utilization of critical resources..." See Column 5, lines 63-67. This CUF is used by the node to adjust its submission information rate (SIR), which is based on the provided CUF and a pre-configured committed information rate (CIR) and an excess information rate (EIR). See Column 8, Lines 29-42. The CIR and EIR parameters are configured during a subscription event. See Column 8, Lines 2-14. These parameters provide thresholds for each node's SIR. That is, the SIR of a node cannot be less than EIR or more than CIR. Column 7, Line 67 through Column 8, Line 2. The SIR is also dependent on the provided CUF. For example, the node adjusts its SIR upwards by a set multiplier so that it remains below the preset EIR if the CUF indicates available resource and adjusts downward by a set multiplier if the CUF so that it remains above the preset CIR if the CUF indicates no available resources. See Column 8, Lines 29-51.

Although the CUF is provided to a node so a node can determine it's own limits based on the CUF which indicates resource usage (as well as it's pre-configured EIR and CIR values), the provided CUF does not itself specify a limit on the operation of a node since it is merely a measured value of the resource utilization. Although Hansen does teach that each node has a CIR and EIR which provide limits to the node's SIR value, these parameters are provided at one time to each node by subscription, in direct contrast to the claimed invention. See Column 8,

Lines 2-14. Said in another way, Hansen teaches away from dynamically specifying parameters which specify a limit on a node's operation, such as CIR and EIR parameters, to a node based on network operation, in the manner claimed, because Hansen teaches that such parameters are provided once during a single event, at subscription. In other words, one would not be motivated to achieve the feedback system of the claimed invention, which provides to a node control information which specifies a limit on a node's operation based on analysis of network operation, by combining (1) the teachings of Abe, which merely provided a feedback loop for providing available bandwidth information to a node, with (2) the teaching of Hansen, which teaches that the CIR and EIR parameters are provided to a node in a single subscription event. Although Hansen does teach providing a CUF parameter to each node, this parameter is merely an indication of the measured bandwidth, similar to what is taught in Abe, and does not specify a limit on a node's operation

Additionally, the reference Abe and the reference Hansen have similar goals of providing mere measurement information such as available bandwidth (Abe) or resource utilization (Hansen) to a node so that the node can self-limit itself. Each reference teaches that a node determines on its own how to adjust its operating parameters, based on the available bandwidth or resources. In other words, the provided information (available bandwidth or resource utilization) merely provide an indication as to what resources are currently available to the node, and does not specify a limit to the node's operation, in the manner claimed. In sum, both references teach away from providing dynamic feedback of control information which specifies a limit on the operation of a NE, in the manner claimed.

Since both Abe and Hanson fail to teach or suggest providing to a network element updated control information which specifies a limit on the operation of a NE that was calculated based on network operation in the manner claimed, it is respectfully submitted that claims 1, 40, 47, and 53 are patentable over Abe and Hanson.

The Examiner's rejections of the dependent claims are also respectfully traversed. However, to expedite prosecution, all of these claims will not be argued separately. Claims 2-6, 10-19, 41-46, and 48-52 each depend directly from independent claims 1, 40, or 47 and, therefore, are respectfully submitted to be patentable over cited art for at least the reasons set forth above with respect to claims 1, 40, and 47. Further, the dependent claims require additional elements that when considered in context of the claimed inventions further patentably distinguish the invention from the cited art. For example, claims 2, 3, 5, and 6 require that the updated control information is a committed information rate value, an excess information rate value, a burst size value, and an excess burst size value, respectively. The cited references fail to teach or suggest such limitations.

Applicant believes that all pending claims are allowable and respectfully requests a Notice of Allowance for this application from the Examiner. Should the Examiner believe that a telephone conference would expedite the prosecution of this application, the undersigned can be reached at the telephone number set out below.

Respectfully submitted,
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